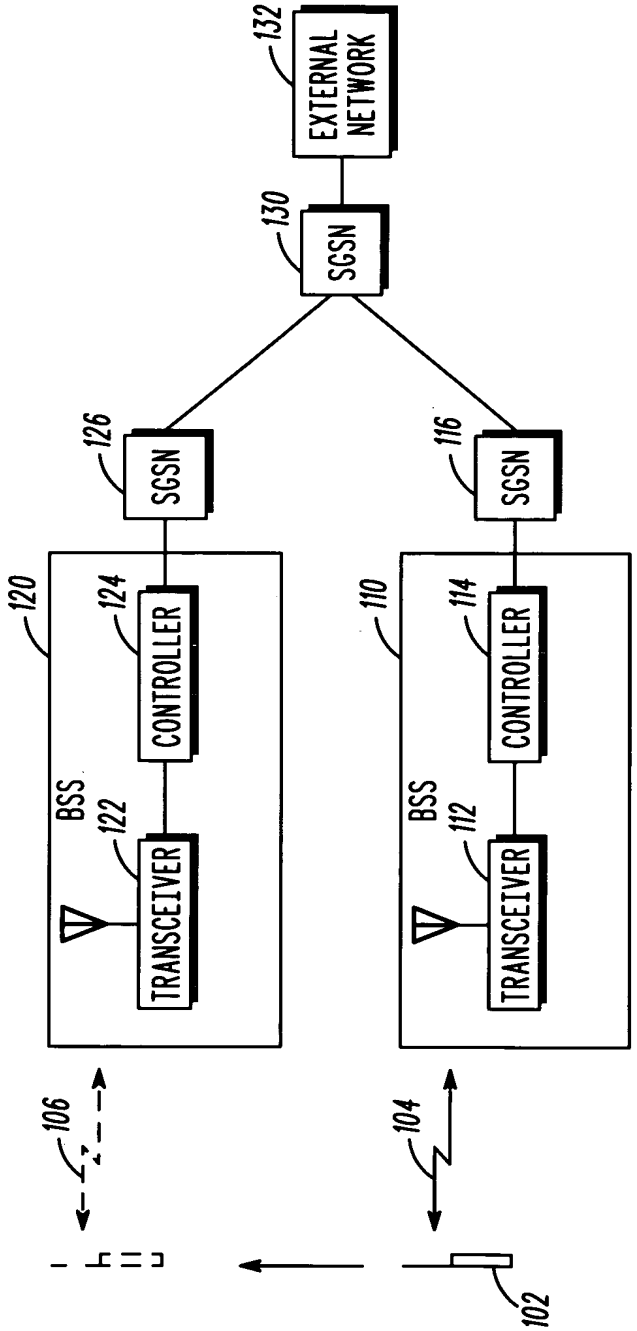

100

—PRIOR ART—

FIG. 1

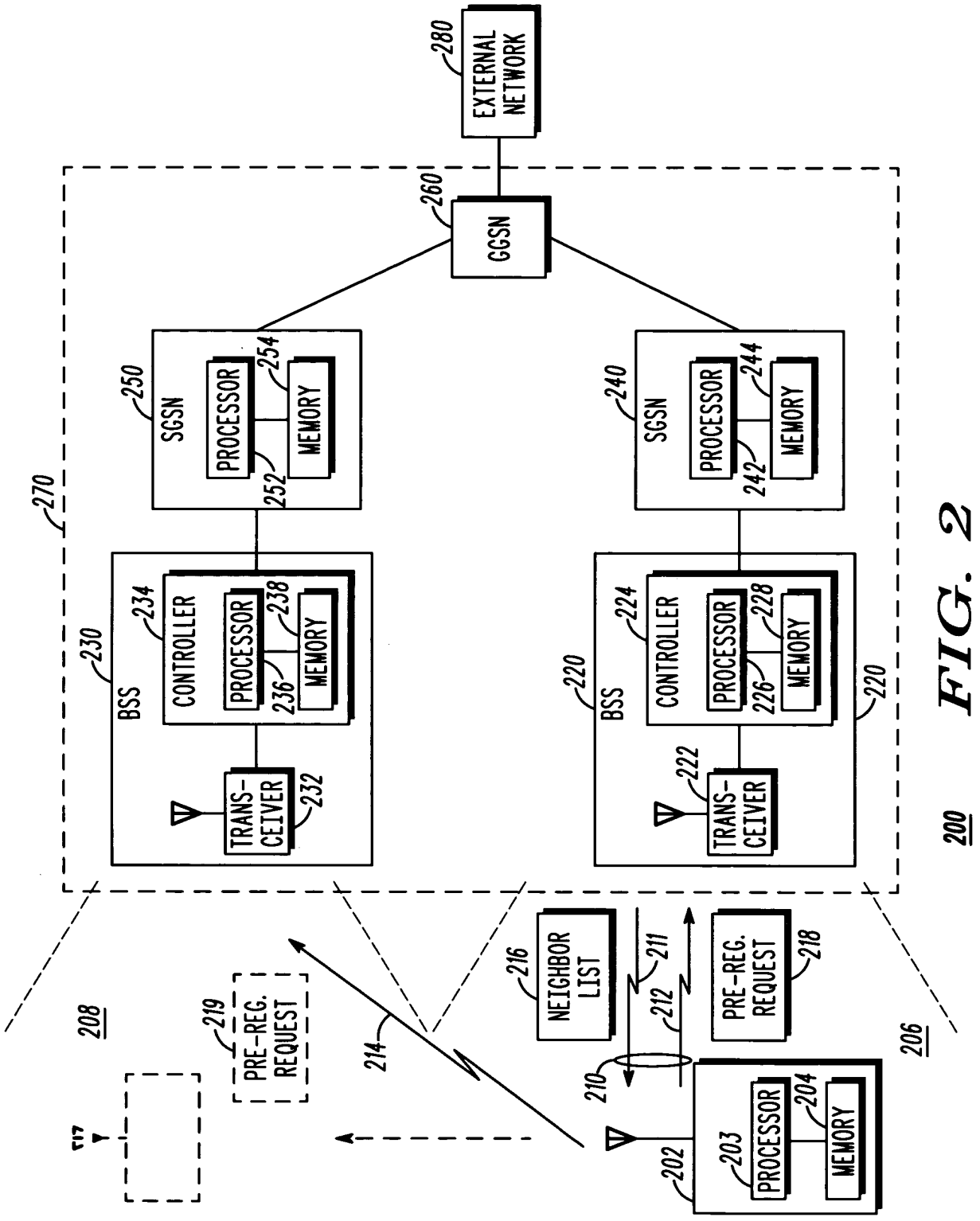
280
EXTERNAL NETWORK
260
GGSN
270
250
SGSN
PROCESSOR
254
MEMORY
252
240
SGSN
PROCESSOR
244
MEMORY
242
230
BSS
234
CONTROLLER
PROCESSOR
238
MEMORY
236
TRANS-CEIVER
232
220
BSS
224
CONTROLLER
PROCESSOR
228
MEMORY
226
220
TRANS-CEIVER
222
216
NEIGHBOR LIST
211
212
PRE-REG. REQUEST
218
210
214
219
PRE-REG. REQUEST
208
206
202
203
PROCESSOR
204
MEMORY

FIG. 2

200

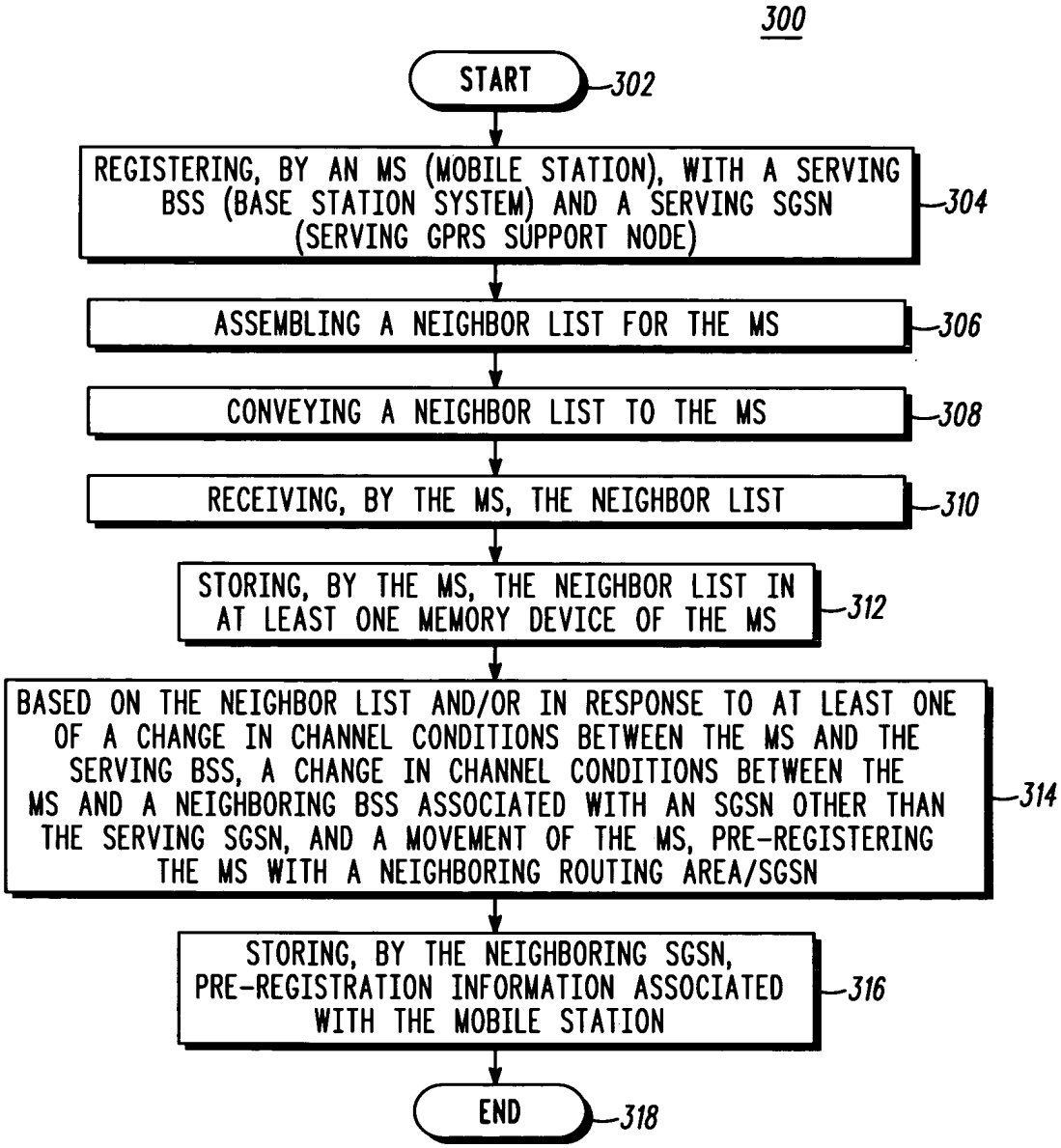
300
START
302
REGISTERING, BY AN MS (MOBILE STATION), WITH A SERVING BSS (BASE STATION SYSTEM) AND A SERVING SGSN (SERVING GPRS SUPPORT NODE)
304
ASSEMBLING A NEIGHBOR LIST FOR THE MS
306
CONVEYING A NEIGHBOR LIST TO THE MS
308
RECEIVING, BY THE MS, THE NEIGHBOR LIST
310
STORING, BY THE MS, THE NEIGHBOR LIST IN AT LEAST ONE MEMORY DEVICE OF THE MS
312
BASED ON THE NEIGHBOR LIST AND/OR IN RESPONSE TO AT LEAST ONE OF A CHANGE IN CHANNEL CONDITIONS BETWEEN THE MS AND THE SERVING BSS, A CHANGE IN CHANNEL CONDITIONS BETWEEN THE MS AND A NEIGHBORING BSS ASSOCIATED WITH AN SGSN OTHER THAN THE SERVING SGSN, AND A MOVEMENT OF THE MS, PRE-REGISTERING THE MS WITH A NEIGHBORING ROUTING AREA/SGSN
314
STORING, BY THE NEIGHBORING SGSN, PRE-REGISTRATION INFORMATION ASSOCIATED WITH THE MOBILE STATION
316
END
318

FIG. 3

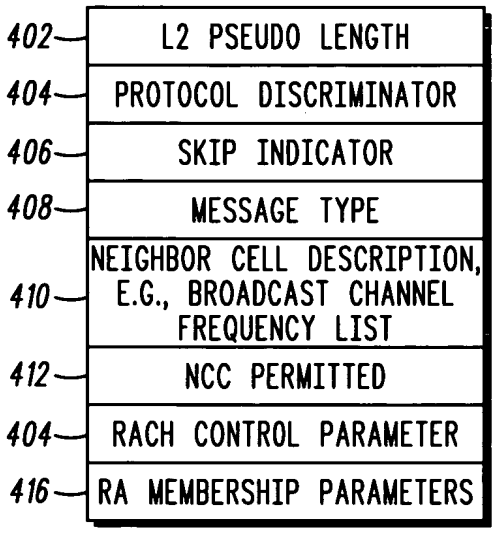
402
L2 PSEUDO LENGTH
404
PROTOCOL DISCRIMINATOR
406
SKIP INDICATOR
408
MESSAGE TYPE
410
NEIGHBOR CELL DESCRIPTION, E.G., BROADCAST CHANNEL FREQUENCY LIST
412
NCC PERMITTED
404
RACH CONTROL PARAMETER
416
RA MEMBERSHIP PARAMETERS
400

FIG. 4

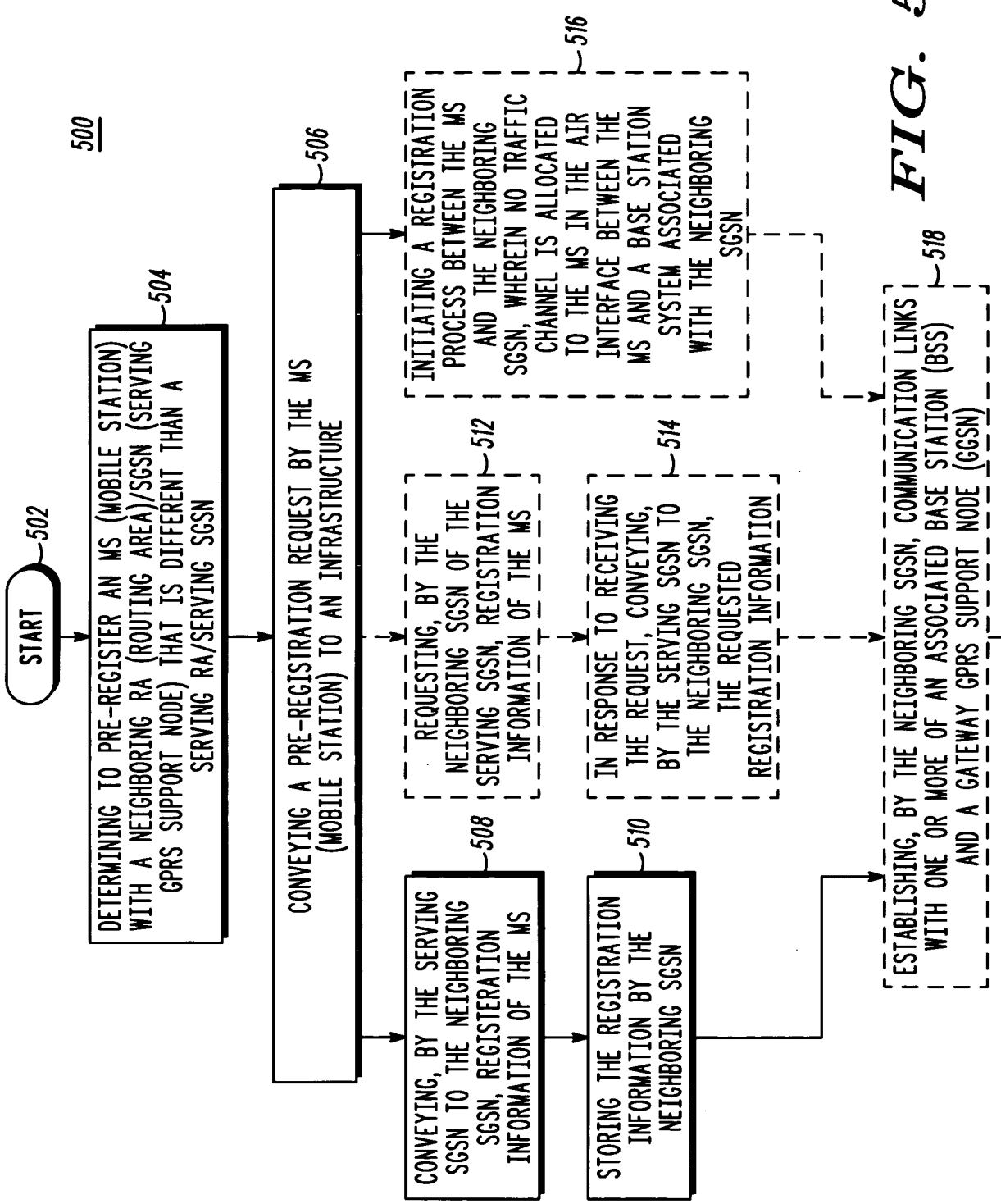
500
START
502
DETERMINING TO PRE-REGISTER AN MS (MOBILE STATION) WITH A NEIGHBORING RA (ROUTING AREA)/SGSN (SERVING GPRS SUPPORT NODE) THAT IS DIFFERENT THAN A SERVING RA/SERVING SGSN
504
CONVEYING A PRE-REGISTRATION REQUEST BY THE MS (MOBILE STATION) TO AN INFRASTRUCTURE
506
CONVEYING, BY THE SERVING SGSN TO THE NEIGHBORING SGSN, REGISTERATION INFORMATION OF THE MS
508
STORING THE REGISTRATION INFORMATION BY THE NEIGHBORING SGSN
510
REQUESTING, BY THE NEIGHBORING SGSN OF THE SERVING SGSN, REGISTRATION INFORMATION OF THE MS
512
IN RESPONSE TO RECEIVING THE REQUEST, CONVEYING, BY THE SERVING SGSN TO THE NEIGHBORING SGSN, THE REQUESTED REGISTRATION INFORMATION
514
INITIATING A REGISTRATION PROCESS BETWEEN THE MS AND THE NEIGHBORING SGSN, WHEREIN NO TRAFFIC CHANNEL IS ALLOCATED TO THE MS IN THE AIR INTERFACE BETWEEN THE MS AND A BASE STATION SYSTEM ASSOCIATED WITH THE NEIGHBORING SGSN
516
ESTABLISHING, BY THE NEIGHBORING SGSN, COMMUNICATION LINKS WITH ONE OR MORE OF AN ASSOCIATED BASE STATION (BSS) AND A GATEWAY GPRS SUPPORT NODE (GGSN)
518
END
502

FIG. 5

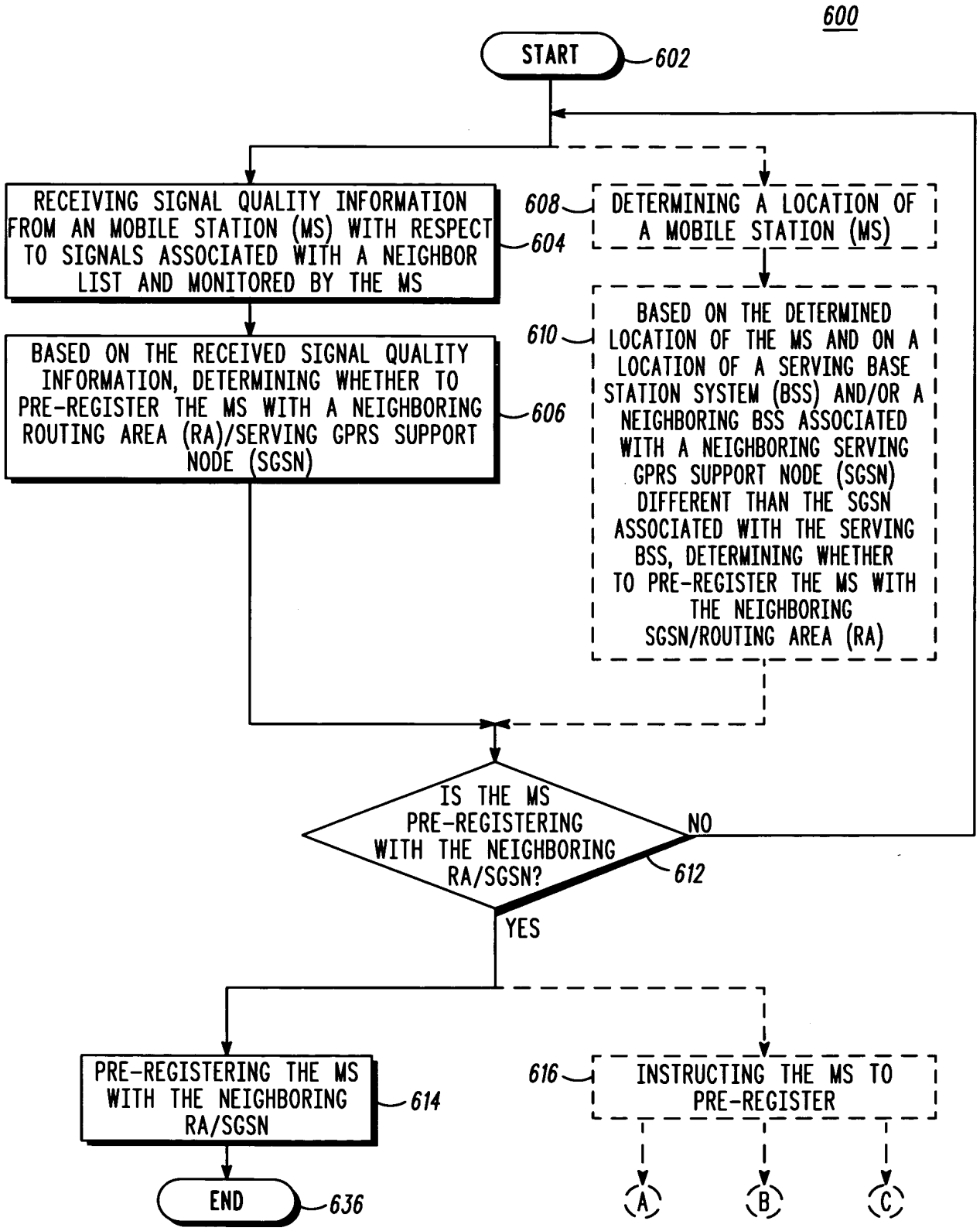
600
START
602
RECEIVING SIGNAL QUALITY INFORMATION FROM AN MOBILE STATION (MS) WITH RESPECT TO SIGNALS ASSOCIATED WITH A NEIGHBOR LIST AND MONITORED BY THE MS
604
BASED ON THE RECEIVED SIGNAL QUALITY INFORMATION, DETERMINING WHETHER TO PRE-REGISTER THE MS WITH A NEIGHBORING ROUTING AREA (RA)/SERVING GPRS SUPPORT NODE (SGSN)
606
608
DETERMINING A LOCATION OF A MOBILE STATION (MS)
610
BASED ON THE DETERMINED LOCATION OF THE MS AND ON A LOCATION OF A SERVING BASE STATION SYSTEM (BSS) AND/OR A NEIGHBORING BSS ASSOCIATED WITH A NEIGHBORING SERVING GPRS SUPPORT NODE (SGSN) DIFFERENT THAN THE SGSN ASSOCIATED WITH THE SERVING BSS, DETERMINING WHETHER TO PRE-REGISTER THE MS WITH THE NEIGHBORING SGSN/ROUTING AREA (RA)
IS THE MS PRE-REGISTERING WITH THE NEIGHBORING RA/SGSN?
NO
612
YES
PRE-REGISTERING THE MS WITH THE NEIGHBORING RA/SGSN
614
616
INSTRUCTING THE MS TO PRE-REGISTER
END
636
A
B
C

FIG. 6A

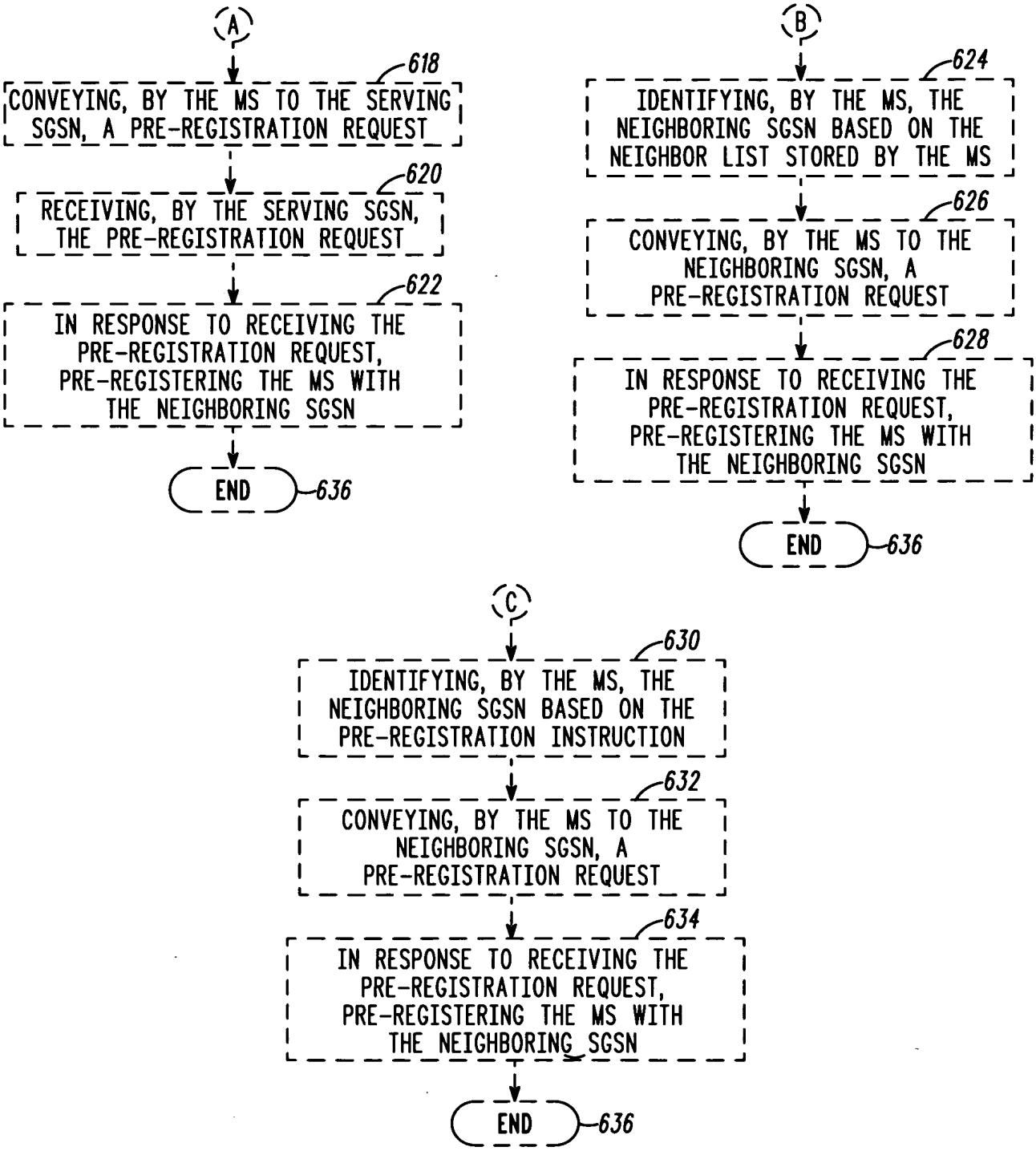
A
618
CONVEYING, BY THE MS TO THE SERVING SGSN, A PRE-REGISTRATION REQUEST
620
RECEIVING, BY THE SERVING SGSN, THE PRE-REGISTRATION REQUEST
622
IN RESPONSE TO RECEIVING THE PRE-REGISTRATION REQUEST, PRE-REGISTERING THE MS WITH THE NEIGHBORING SGSN
END
636
B
624
IDENTIFYING, BY THE MS, THE NEIGHBORING SGSN BASED ON THE NEIGHBOR LIST STORED BY THE MS
626
CONVEYING, BY THE MS TO THE NEIGHBORING SGSN, A PRE-REGISTRATION REQUEST
628
IN RESPONSE TO RECEIVING THE PRE-REGISTRATION REQUEST, PRE-REGISTERING THE MS WITH THE NEIGHBORING SGSN
END
636
C
630
IDENTIFYING, BY THE MS, THE NEIGHBORING SGSN BASED ON THE PRE-REGISTRATION INSTRUCTION
632
CONVEYING, BY THE MS TO THE NEIGHBORING SGSN, A PRE-REGISTRATION REQUEST
634
IN RESPONSE TO RECEIVING THE PRE-REGISTRATION REQUEST, PRE-REGISTERING THE MS WITH THE NEIGHBORING SGSN
END
636

FIG. 6B